THE INVENTION CLAIMED IS

1. A microchannel Cross load array, comprising:

a cathode,

an array of sample wells,

an array of waste wells, said sample well comprising twice the number of waste wells,

an anode, and

an array of functionally identical channels, each channel having an injection point with one well of said array of sample wells, one well of said array of waste wells, said cathode and said anode.

2. The microchannel Cross load array of Claim 1, which said cathode and said anode each define common slots.

3. The microchannel Cross load array of Claim 1, wherein said sample wells with parallel sides are selected from the group to define substantially circular holes, tapered holes, and holes.

4. The microchannel Cross load array of Claim 1, wherein said waste wells define substantially circular holes.

5. The microchannel Cross load array of Claim 1, wherein both said sample and waste wells define substantially circular holes.

6. The microchannel Cross load array of Claim 1, wherein said sample wells define substantially square holes.

7. The microchannel Cross load array of Claim 1, wherein said waste wells define substantially square holes.

8. The microchannel Cross load array of Claim 1, wherein both said sample and waste wells define substantially square holes.

9. The microchannel Cross load array of Claim 1, wherein both said sample and waste wells are formed on a biaxial, collinear grid by EDM machining or other machining process producing orthogonal rows and columns.

10. The microchannel Cross load array of Claim 1, wherein said channels are identical in shape.

11. The microchannel Cross load array of Claim 1, wherein said array of channels form flow paths for each channel which are identical in shape, using multiple mirror image pieces.

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12. The microchannel cross load array of Claim 1, wherein said array of channels form equal or unequal flow paths from said injection point to said cathode and from said injection point to said waste wells.

13. The microchannel Cross load array of Claim 1, wherein said array of channels from symmetric flow paths from said injection point to said cathode and to said waste wells.

14. The microchannel Cross load array of Claim 13, wherein said symmetric flow paths are of the same lengths.

15. The microchannel Cross load array of Claim 1, wherein said array of sample wells are located in a plurality of rows.

16. The microchannel Cross load array of Claim 15, wherein adjacent channels which are located adjacent said anode have a pitch, Pch, wherein adjacent sample wells in each row have as pitch, Ps, and wherein Ps equals 2Pch.

17. The microchannel Cross load array of Claim 16, wherein the pitch, Pch, is about 0.5-4.5 mm.

18. The microchannel Cross load array of Claim 15, wherein each row of sample wells has a common bias.

19. The microchannel Cross load array of Claim 1, wherein said array of waste wells are located in a row, and have a common bias.

20. An architecture for microchannel arrays using T or Cross loading for injection and separation chemistry applications performed in microfluidic configurations,

said architecture producing a dense layout of functionally identical shaped microchannels, sample wells, and waste wells, and including a common cathode and a common anode,

said microchannels each having an injection point interconnecting a sample well, a waste well, a cathode and an anode,

said microchannels each defining equal length flow paths between said injection point and said waste, and between said injection point and said cathode.

21. The architecture for microchannel arrays of Claim 20, wherein said flow paths are symmetric.

22. The architecture for microchannel arrays of Claim 20, wherein said sample wells are located in a plurality of rows, and wherein said waste wells are located in a single row.

23. The architecture for microchannel arrays of Claim 20, wherein said microchannels each include flow paths from said injection point to a sample well and from said injection point to said anode.

24. The architecture for microchannel arrays of Claim 23, wherein adjacent flow paths of said channels located adjacent said anode have a channel pitch, Pch, wherein adjacent sample wells have a sample pitch, Ps, and wherein Ps = 2Pch.

25. The architecture for microchannel arrays of Claim 24, wherein the channel pitch, Pch, is about 0.5-4.5 mm.

26. The architecture for microchannel arrays of Claim 20, wherein said sample wells and said waste wells having a configuration selected from the group consisting of circular and square shapes with straight or tapered walls.

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27. The architecture for microchannel arrays of Claim 20, wherein said common cathode and said common anode are each of a slot configuration.

28. The architecture for microchannel arrays of Claim 20, wherein said sample well are located in a plurality of rows, wherein said waste wells are located in a single row, and wherein each of said rows has a common bias.

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